

REMARKS

All claims were rejected under 35 USC §103(a) as obvious in view of Hawkins, U.S. Patent No. 5,898,071. Applicants traverse the rejection.

According to the Office action at page 2,

Hawkins teaches a method of isolating DNA from a sample in the absence of any chaotropic agent via binding of the nucleic acid to a magnetic polymer bead in the presence of the detergent SDS, wherein the use of magnetic beads obviates the need for centrifugation. (emphasis added)

Applicants respectfully point out that this does not accurately describe Hawkins' teachings. Hawkins does say that magnetic microparticles can be used in his methods, but he specifically teaches away from use of polymer encapsulated solid supports. According to Hawkins at col.3, lines 61-67, it is essential to have "functional groups" coating the surface of the solid support, and such "functional groups" are not present on polymer encapsulated microparticles. The only examples of useful solid supports disclosed by Hawkins have a "silane coat to which a wide variety of bioaffinity adsorbents can be covalently bound through selected coupling chemistries, thereby coating the surface of the microparticles with functional groups." (col.3, lines 7-11). Hawkins gives no guidance as to how to make polymeric solid supports work in his disclosed method. In fact, Hawkins states outright that "[P]olymer encapsulated magnetic microparticles do not bind DNA in the method of the present invention." Since all of the present claims require that the solid support comprise an organic polymer, and Hawkins teaches that polymers should be avoided, Applicants maintain that it would clearly not have been obvious to carry out the presently claimed methods or manufacture the presently claimed kits in view of this reference. In view of this *teaching away* in Hawkins, withdrawal of the rejection is appropriate and is requested.

Although the above argument is more than sufficient to rebut the rejection, Applicants point out that there are further reasons to regard the presently claimed methods and kits as nonobvious in view of Hawkins. These are discussed below.

The Examiner appears to regard isolation of genomic DNA as being simply an “alternative embodiment” of Hawkins’ teachings. It is not. Applicants maintain that there is no motivation in Hawkins to isolate genomic DNA; to the contrary, the sole mentions of genomic DNA in Hawkins are in the context of how to get rid of it so that the desirable plasmid DNA or phage DNA can be isolated (see, e.g., col. 4, lines 38-61, and also Examples 1-4 that illustrate that where genomic DNA is present it is removed by salting out with 3M KOAc (Examples 1-3) or removed by centrifugation to remove cells containing the genomic DNA (Example 4)). This cannot be read as a motivation to adapt the method to isolate genomic DNA. Furthermore, there is no reason provided in the art to expect that the Hawkins method would work on genomic DNA, given the length and complex nature of genomic DNA compared to the types of DNA isolated by Hawkins.

Nor is there either a motivation or a reasonable expectation in the art that a solid support comprising an organic polymer (as required by all of the present claims) would be useful for binding any type of DNA, given Hawkins’ explicit teaching at col. 3, lines 61-64, that his method does not work with polymer encapsulated microparticles.

Furthermore, there is no motivation to use detergent in any methods for the isolation of genomic DNA even if the skilled person were motivated to attempt isolation of such DNA. Detergent is used by Hawkins only for methods of lysis and to rid the samples of genomic DNA (see the description and Examples as referred to above). In methods in which only the target DNA of interest is present, as exemplified by Examples 5 and 6, no detergent is employed, and the description does not advocate the use of detergent under such circumstances. Hawkins plainly does not teach that detergent plays any role in binding DNA to the solid support. In applying the method to genomic DNA, in which removal of that DNA is not desired, Hawkins provides no motivation to employ detergent. This is, however, a crucial component of the method as claimed.

The above arguments apply to all of the pending claims. In addition, Applicants note that the Examiner has not addressed the specific limitations of a number of the dependent claims, to explain why they would have been obvious in view of Hawkins.

For example, **claims 5 and 25** require that a disrupting or lysing step be carried out prior to contacting the sample with the detergent. Hawkins, who taught no use of detergent other than to effect lysis of cells or phage, did not suggest any reason to contact the sample with detergent after the lysis step, as required by claims 5 and 25.

Claim 15 specifies that the genomic DNA is eluted from the solid support by heating; in contrast, Hawkins' method requires that elution be accomplished by certain changes to the constituents of the solution (see col.6, lines 5-25). According to Hawkins at col. 7, lines 12-13, "temperature does not appear to be critical in the method of separating DNA of the present invention." As there is no indication in Hawkins that heating would be effective in eluting the bound DNA, the method of claim 15 certainly can't be deemed obvious in view of this reference.

Furthermore, **claims 16, 17, 20, 22, and 29** all require that the solid support comprise polystyrene. Hawkins explicitly states at col. 3, lines 63-67, that Dynabeads® M-280 (which are polystyrene encapsulated magnetic beads) will not bind DNA in the method disclosed in the reference. The Examiner has not explained why he believes that, despite this contrary teaching, it would have been obvious to use polystyrene beads to isolate genomic DNA. Indeed, the fact that polystyrene beads work very well in the presently claimed methods (see, e.g., several examples of use of Dynabeads® in the present specification) *yet did not work at all in the Hawkins method* clearly illustrates the fact that the presently claimed detergent-based methods are radically different from the methods disclosed in Hawkins that rely not on detergent, but rather on (a) specific functional groups on the solid support, (b) high salt and (c) significant PEG levels to effect binding of DNA to the solid support.

In view of the above arguments, Applicants request that the rejection be withdrawn and the claims allowed. If the Examiner wishes to discuss the matter, he is encouraged to telephone the undersigned directly at 808 986 0300, any day after noon Eastern Time, up until April 12, 2005. After that date, the undersigned's telephone number reverts to that set forth below.

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Enclosed is a \$1,020.00 check for the Petition for Extension of Time fee and a Notice of Appeal with the appropriate fee therefor. Apply any other charges or credits to deposit account 06-1050, referencing attorney docket number 08269-003001.

Respectfully submitted,

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